UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO.   : 7,120,685 B2
APPLICATION NO. : 09/891584
DATED   : October 10, 2006
INVENTOR(S)   : Ullmann et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:
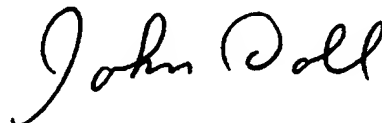
Delete the title page and substitute therefore the attached title page.

Figures 1-8 are replaced by the attached 9 Sheets with Replacement Drawings.

This certificate supersedes the Certificate of Correction issued May 5, 2009.

Signed and Sealed this

Twenty-sixth Day of May, 2009

JOHN DOLL
Acting Director of the United States Patent and Trademark Office

(12) **United States Patent**
Ullmann et al.

(10) **Patent No.:** US 7,120,685 B2
(45) **Date of Patent:** Oct. 10, 2006

(54) **METHOD AND APPARATUS FOR DYNAMIC CONFIGURABLE LOGGING OF ACTIVITIES IN A DISTRIBUTED COMPUTING SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 750 days.

(21) Appl. No.: 09/891,584

(22) Filed: **Jun. 26, 2001**

(65) **Prior Publication Data**

US 2002/0198983 A1   Dec. 26, 2002

(51) **Int. Cl.**
G06F 15/173   (2006.01)
(52) **U.S. Cl.** 709/224; 710/18
(58) **Field of Classification Search** 709/224, 709/204, 223; 714/48, 45; 719/318; 707/10, 707/200; 710/8; 377/26
See application file for complete search history.

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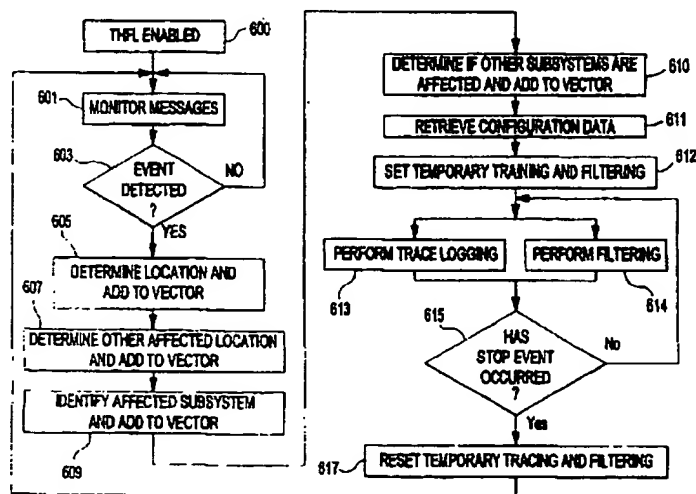
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(57)   **ABSTRACT**

A system and method for implementing tracking of computing system activities wherein the tracking can be dynamically adjusted. The system provides a multiple level logging system having a first level for detecting message level errors and a second trace level for obtaining trace information and for filtering same to provide more details to be used for implementing corrective action. A set of filters is provide to further refine the data which is provided to a user/system administrator. The system also provides for selective activation of tracking and logging for selected subsystems, as well as the ability to vary the frequency at which the tracking is performed. The frequency of logging can be adjusted upward in response to detection of a error and can then be decreased, or the tracking selectively disabled or entirely stopped upon detection of a stop event.
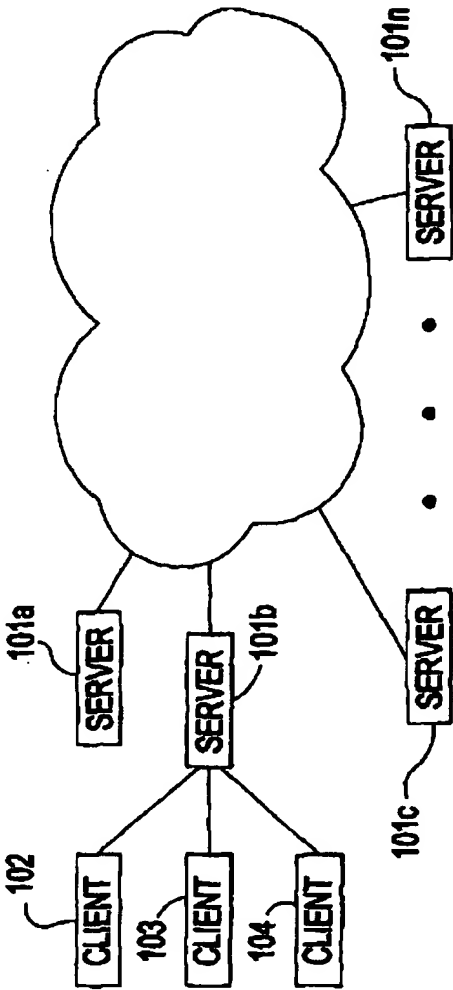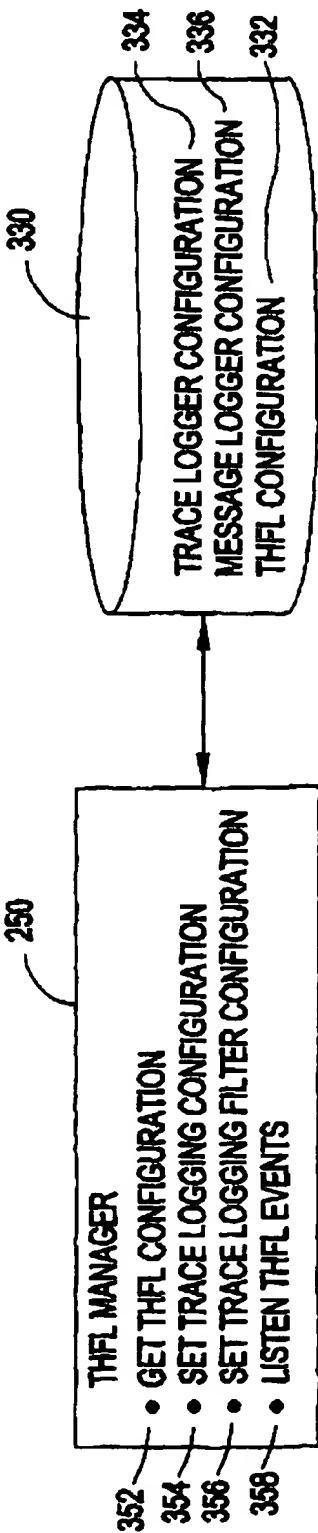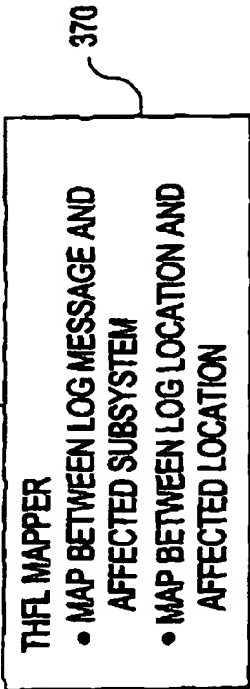
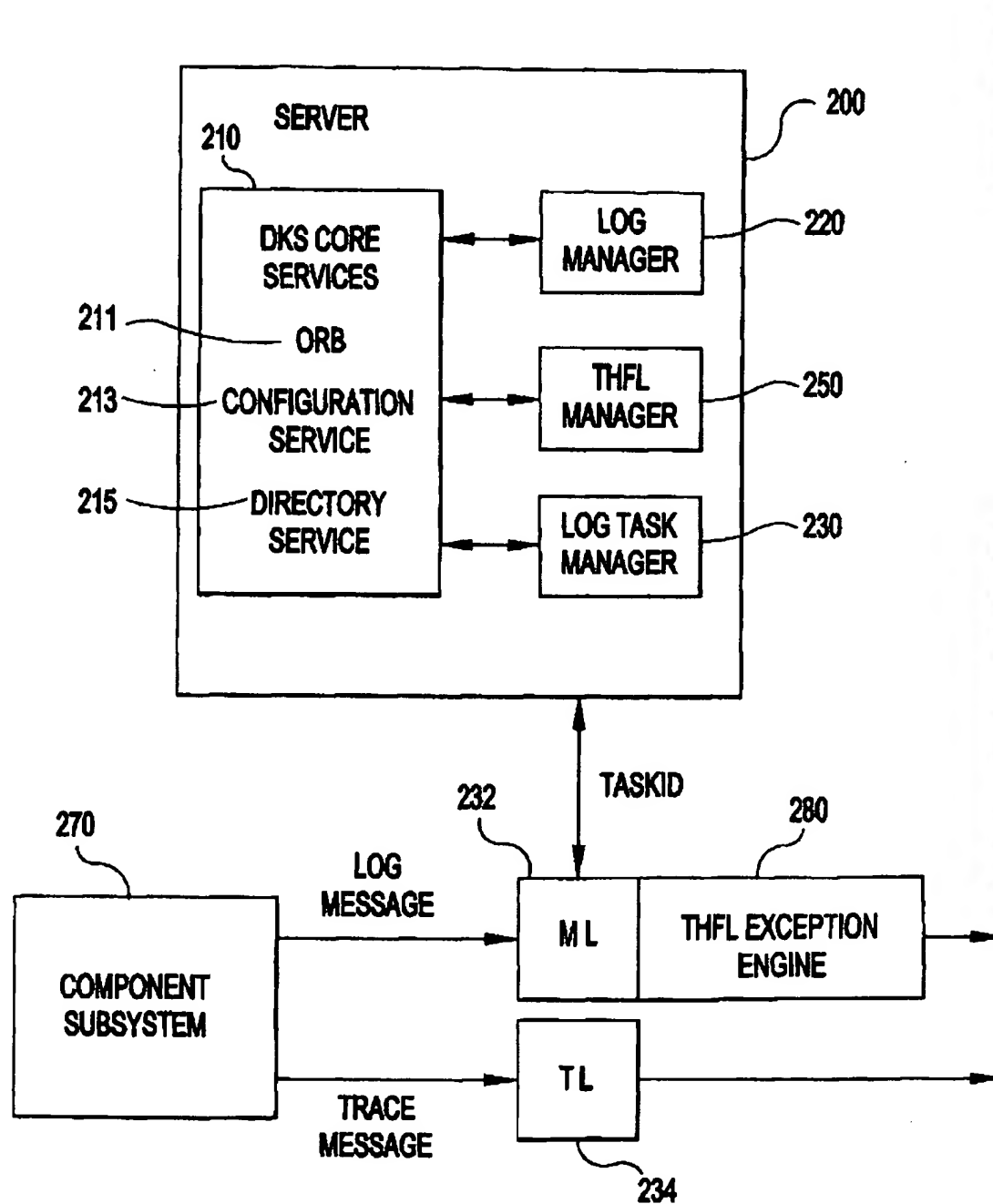**22 Claims, 7 Drawing Sheets**

FIG.1

FIG.3

FIG.2A

FIG.2

FIG.2A	FIG.2B

FIG.2B

222 — LOGGING HANDLER

285

292 — DB HANDLER

224

238 — STORAGE

FILTER

294 — FILE HANDLER

FORMATTER

296 — CONSOLE HANDLER
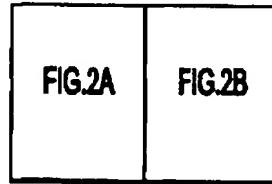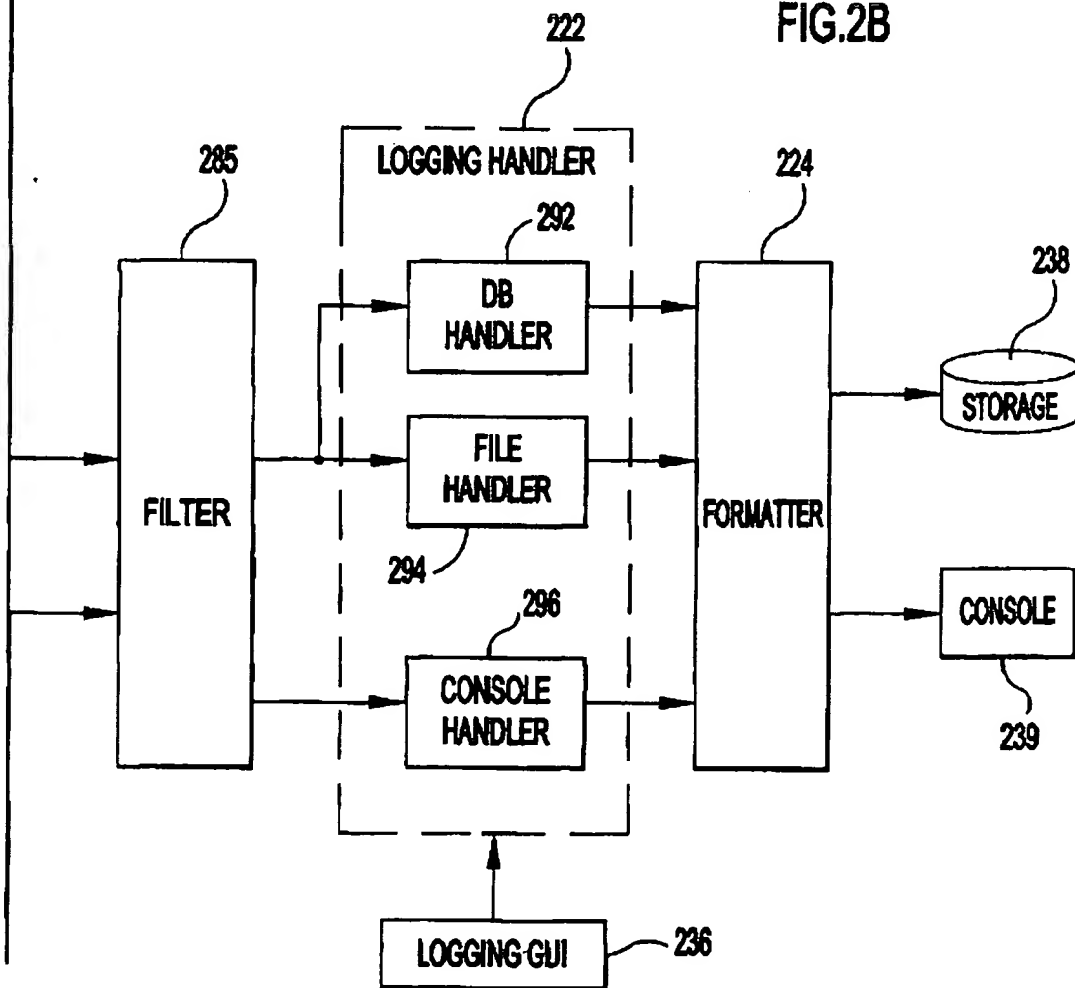
CONSOLE

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236 — LOGGING GUI

√ Transient High Frequency Logging Configuration GUI

When to Enable Transient High Frequency Logging:

   ∅ Run Periodic Detection

      ● Daily   time of day   = _____

      ● Monthly   day of month = _____

      ● Continuous   Polling interval every _____ minutes

   ∅ Enable immediately as response to ALL Error Message (very expensive from a
performance standpoint)

   ∅ Select Subsystem(s) which error events turn on temporary tracing
      Subsystem DropDown: Directory
                              IP Driver
                              ORB
                              Etc.

Duration of Transient High Frequency Logging:

   ∅ (default) 1 hour after error message
   ∅ Indefinite until Administrator turns off tracing

FIG.4

FIG.5A

View Subsystems Performing Transient High Frequency Trace Logging

Current List
    Drop down List of Subsystems
        Directory
        IP Driver
        ServiceManager
        ORB

List in Last _____ hours
    Drop down List of Subsystems

List in Last _____ days
    Drop down List of Subsystems

FIG.5B

Details Views ForEachSubsystem

View ErrorMessage that Inititiated Increase Logging frequency:

2001.05.16 07:17:41.139 FNGDR3012E The Messaging Service for the directory running on the
local ORB was unable to subscribe to event messages. No directory events can be processed
by the ORB.

High Frequency Logging Interval 2001.05.16 07:17:41.139 - 2001.05.16 07:17:41.139
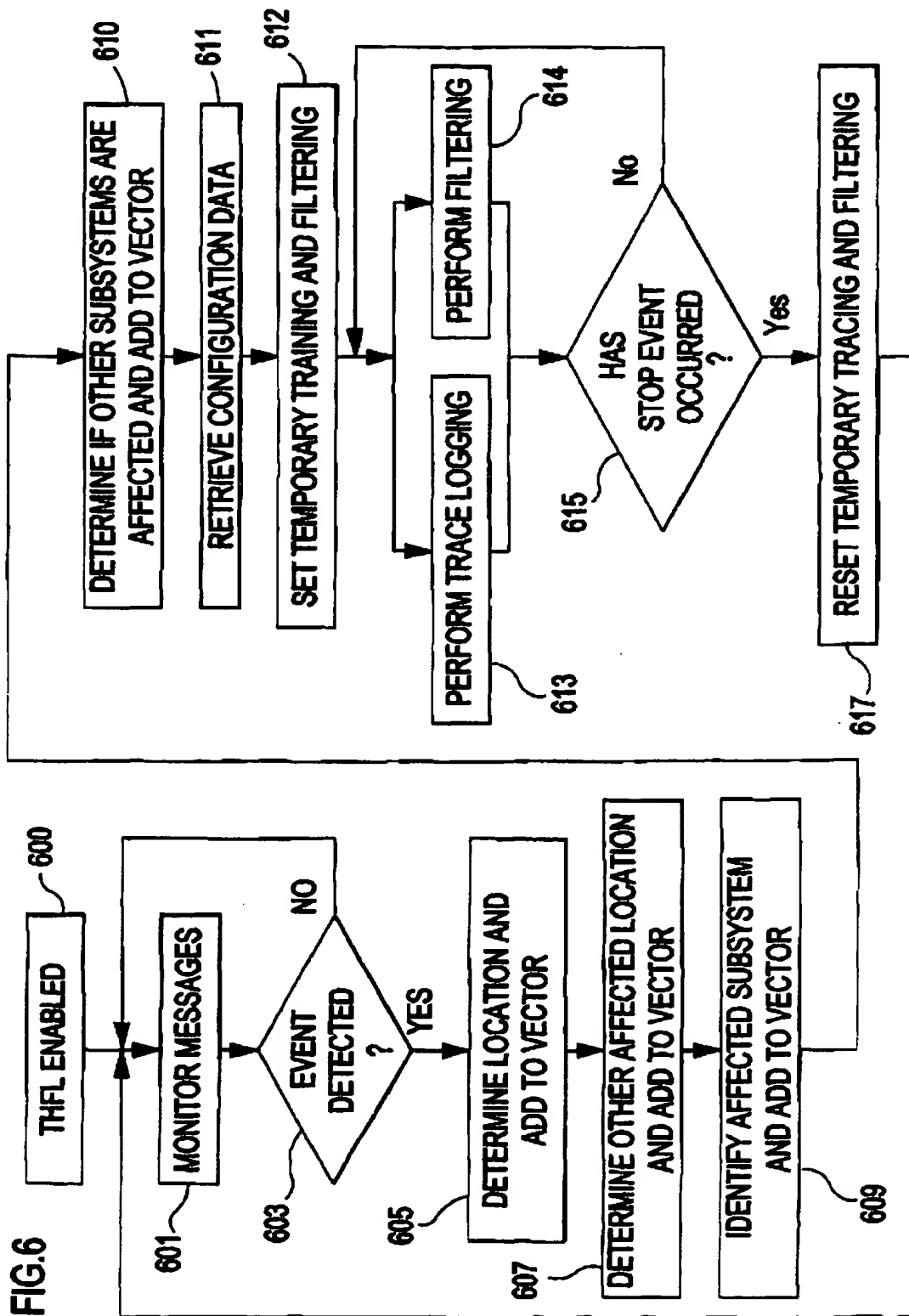
View MessageLog Button
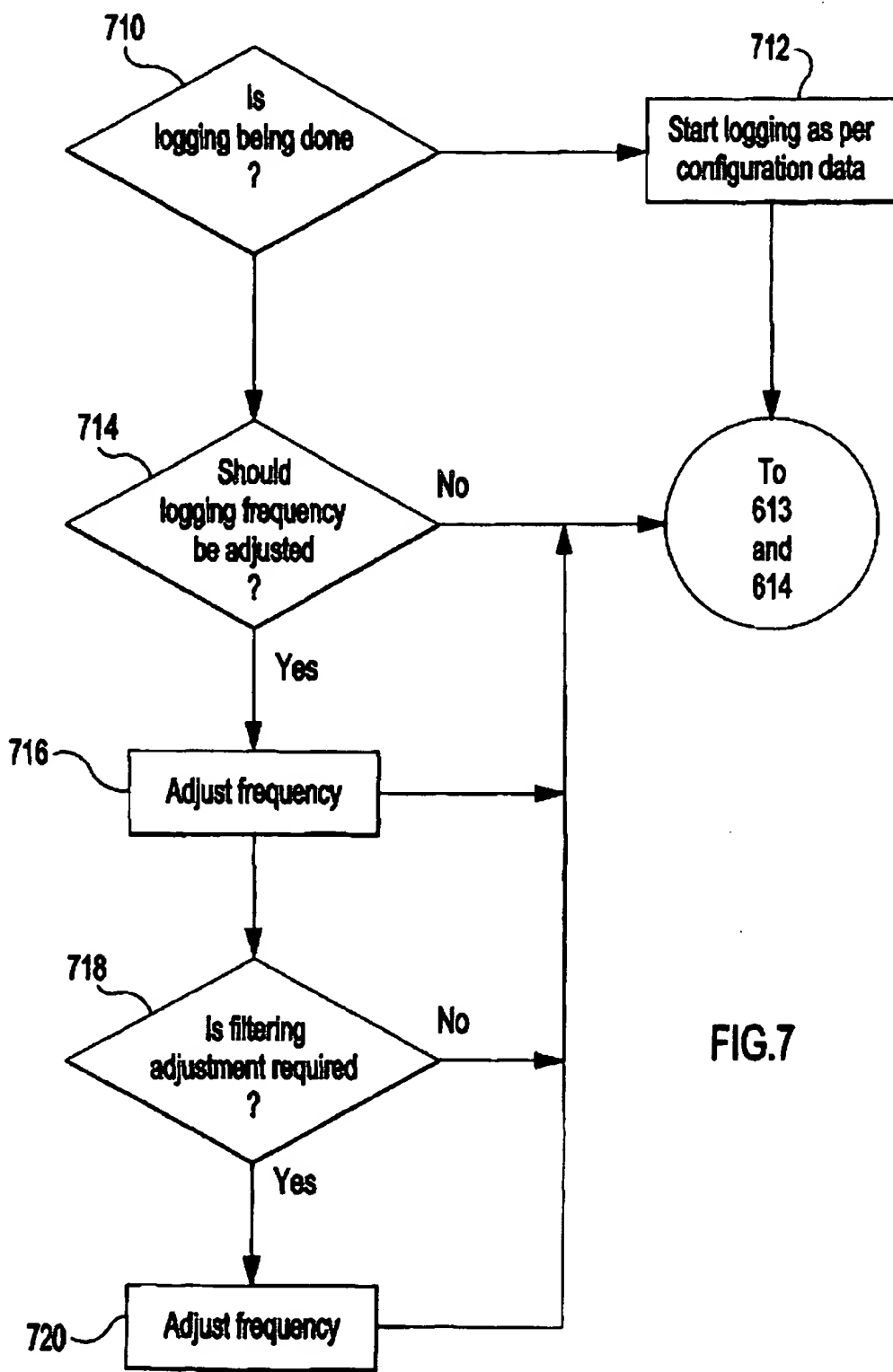ViewTraceLog Button
ViewCombinedTimeBoundLog Button

FIG.6

THFL ENABLED

MONITOR MESSAGES — 601

EVENT DETECTED ? — 603

NO

YES

DETERMINE LOCATION AND ADD TO VECTOR — 605

DETERMINE OTHER AFFECTED LOCATION AND ADD TO VECTOR — 607

IDENTIFY AFFECTED SUBSYSTEM AND ADD TO VECTOR — 609

600

DETERMINE IF OTHER SUBSYSTEMS ARE AFFECTED AND ADD TO VECTOR — 610

RETRIEVE CONFIGURATION DATA — 611

SET TEMPORARY TRAINING AND FILTERING — 612

PERFORM TRACE LOGGING — 613

PERFORM FILTERING — 614

HAS STOP EVENT OCCURRED ? — 615

No

Yes

RESET TEMPORARY TRACING AND FILTERING — 617

710

Is logging being done ?

712

Start logging as per configuration data

714

Should logging frequency be adjusted ?

No

To 613 and 614

Yes

716

Adjust frequency

718

Is filtering adjustment required ?

No

Yes

720

Adjust frequency

FIG.7

FIG.8